UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2006*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☒ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date *07/07/2006 and 09/15/2008*.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____ .

DETAILED ACTION

1. Claims 1-8 are pending in Instant Application.

Priority

2. Examiner acknowledges Applicant's claim to priority benefits of Japanese Application No. 2004-004328 filed 01/09/2004.

Information Disclosure Statement

3. The information disclosure statement(s) (IDS) submitted on 07/07/2006 and 09/15/2008 is/are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement(s) is/are being considered by the examiner.

Claim Rejections - 35 USC § 101

4. Claim 7 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

4.1 As per claim 7, the instant claim is a program *per se*. Therefore, the claims are directed to non-statutory subject matter (see MPEP 2106.01).

Claim Rejections - 35 USC § 112

> The following is a quotation of the second paragraph of 35 U.S.C. 112:
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being **indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 1, the instant claim recites "conducting actual transition *tenting*" (emphasis

added). The term "tenting" is indefinite because the specification does not clearly define the

term in this context. The word "means" is preceded by the word(s) "virtual engine test" in an

attempt to use a "means" clause to recite a claim element as a means for performing a specified

function. However, immediately following the word "means" is the words "for simulating". It is

unclear whether the claimed means is "for virtual engine testing" or "for simulating a transition

state" and therefore it is impossible to determine the equivalents of the element, as required by

35 U.S.C. 112, sixth paragraph. Likewise, an "actual engine transition test means for conducting

actual transition tenting" is unclear whether the claimed means is "for actual engine transition

testing" or "for conducting actual transition tenting". The instant claim further recites "actual

control means that controls that actual engine" does not properly invoke 35 U.S.C. 112, sixth

paragraph as a "means or step plus function" construct. Likewise, "virtual control means that

emulates" does not properly invoke 35 U.S.C. 112, sixth paragraph as a "means or step plus

function" construct. See MPEP 2181. Additionally, the instant claim recites "... control signal

output from the virtual control means from a corresponding portion of an engine control signal

output from the actual control means, ...". It is unclear whether the control signal output is from

the virtual control means or actual control means.

   As per claim 4 and 7, the instant claims recite "actual control means that controls an actual

engine" which does not properly invoke 35 U.S.C. 112, sixth paragraph as a "means or step plus

function" construct. See MPEP 2181.

6. The above cited rejections are merely exemplary.

7. The Applicant(s) are respectfully requested to correct all similar errors.

8. Claims not specifically mentioned are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

9.   Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Kawai et al (US***

Pat. No. 5,313,395) in view of ***Santori et al (US Pat. No. 7,076,411 B2)***.

Kawai et al discloses: 1. An engine transition test instrument comprising:

virtual engine test means for simulating a transition state in which an engine

rotational speed or torque changes with time **(col. 6, lines 46-57, fig. 3 and fig. 4,**

teaches rotating speed is measured and modeled); and

actual engine transition test means for conducting actual transition tenting using

an actual engine and actual control means that controls that actual engine **(col. 3, lines 65**

to col. 4, line 5 and fig. 1, teaches a rotating speed adjusting means to adjust the

engine speed of the internal combustion engine and a control means which

calculates a control value.),

wherein the virtual engine test means comprises simulation means for simulating

behavior of an engine by a transition engine model created based on data obtained by

driving the actual engine while changing a value of at least one controlled factor **(col. 5,**

lines 46-59 and col. 6, lines 35-42 and lines 46-59, teaches an autoregressive moving

average model is utilized for the model of a system which controls the idling speed of

the engine. The constants for the model are determined experimentally by means of

a step response. It would have been obvious to one of ordinary skill in the art to

drive an engine to gather experimental data for better accuracy.);

virtual control means that emulates the actual control means and supplies an

engine control signal to the simulation means **(col. 3, lines 66 to col. 4, line 5 and col.**

19, lines 30-35, teaches a control means); and

the actual engine transition test means comprises means for switching to an

engine control signal output from the virtual control means **(i.e. dynamic model)** from a

corresponding portion of an engine control signal output from the actual control means,

and supplying a switched signal to the actual engine **(col. 3, lines 26-37, col. 21, lines 60-**

63 and col. 23, lines 57-62, teaches a dynamic model to control the idling speed of an

internal combustion engine.).

Kawai et al does not expressly disclose simulation means for simulating behavior of an engine.

Santori et al, however, discloses simulation means for simulating behavior of an engine **(col.4**

47-52, 58-63 and fig. 2A, teaches simulation of automobile coupled to control unit).

Kawai et al and Santori et al are analogous art because they are from similar problem solving

area of designing control unit. At the time of the invention it would have been obvious to person

of ordinary skill in the art to utilize the principles of testing control unit using hardware-in-the-

loop simulation as discussed by Santori et al to test the unit to control idling speed of an engine

for purpose of testing response of a control unit **(Santori et al: col. 58-64)**.

Santori et al discloses: 2. The engine transition test instrument according to claim 1, wherein the

virtual engine test means further comprises a control value operation means that supplies a

control value for the controlled factor to the virtual control means **(see fig. 10, item 427 and 429,**

col. 5, lines 17-26, col. 21, lines 61-67, target device may execute control algorithm to control physical system), causes simulation results by the simulation means to be displayed on display means of an operator **(see fig. 5, items 310, 312, and 314, col. 17, lines 52-59, teaches a GUI to control a hardware-in-the-loop simulation)**, and corrects the control value according to an operation by the operator **(col. 6, lines 13-16, and fig. 5, items 310 and 312, teaches user change various parameters)**.

Kawai et al discloses: 3. The engine transition test instrument according to claim 1, wherein the actual control means is configured so as to perform feed back control with referencing an output value of the actual engine **(col. 3, line 60 to col. 4, line 5 and fig. 1, teaches adjusting rotating speed of internal combustion engine using a feedback loop)** and the instrument comprises means for correcting an output value from the actual engine that has changed when an engine control signal output from the virtual control means was supplied to the actual engine to a value before such a change was made, and feeding back the corrected value to the actual control means **(col. 4, lines 5-26, teaches control means is provided with first control value setting means which sets a state variable according to detected rotating speed by previous operation timing. A selecting means is disclosed to select the desired first control value or second control value)**.

Kawai et al discloses: 4. An engine transition test method comprising:

a first step of creating a transition engine model based on data obtained by driving an actual engine while changing a value of at least one controlled factor in a transition state in which an engine rotational speed or torque changes with time **(col. 5, lines 46-59 and col. 6, lines 35-42 and lines 46-59, teaches an autoregressive moving average**

model is utilized for the model of a system which controls the idling speed of the

engine. The constants for the model are determined experimentally by means of a

step response. It would have been obvious to one of ordinary skill in the art to drive

an engine to gather experimental data for better accuracy.);

a second step of emulating actual control means that controls an actual engine,

generating an engine control signal based on a control value set for the controlled factor

(col. 3, lines 66 to col. 4, line 5 and col. 19, lines 30-35, teaches a control means), and

operating the transition engine model as a virtual engine; and

a third step of switching to an engine control signal generated in the second step

from a corresponding portion of an engine control signal output from actual control

means, and supplying the switched signal to the actual engine **(col. 3, lines 26-37, col. 21,**

lines 60-63 and col. 23, lines 57-62, teaches a dynamic model to control the idling

speed of an internal combustion engine.).

Kawai et al does not expressly disclose operating the transition engine model as a virtual engine.

Santori et al, however, discloses operating the transition engine model as a virtual engine **(col.4**

47-52, 58-63 and fig. 2A, teaches simulation of automobile coupled to control unit).

Kawai et al and Santori et al are analogous art because they are from similar problem solving

area of designing control unit. At the time of the invention it would have been obvious to person

of ordinary skill in the art to utilize the principles of testing control unit using hardware-in-the-

loop simulation as discussed by Santori et al to test the unit to control idling speed of an engine

for purpose of testing response of a control unit **(Santori et al: col. 58-64)**.

Kawai et al discloses: 5. The engine transition test method according to claim 4, wherein the

second step is repeated while changing the control value **(col. 3, lines 66 to col. 4, line 5 and col.**

19, lines 30-35 fig. 1, teaches a control means which is in a loop that controls an engine.

The loop allows the control value to be adjusted according to the state of the engine), and

the third step is performed when an output value from the virtual engine satisfies objective

performance **(col. 5, lines 39-45)**.

Kawai et al discloses: 6. The engine transition test method according to claim 4, wherein an

output value from the actual engine that has changed when an engine control signal generated in

the second step was supplied to the actual engine **(col. 5, lines 39-45)** is corrected to a value

before such a change was made, and the corrected value is fed back to the actual control means

(col. 1 61-65, col. 3, lines 66 to col. 4, line 5 and col. 19, lines 30-35 fig. 1, teaches a control

means which is in a loop that controls an engine. The loop allows the control value to be

adjusted according to the state of the engine).

Kawai et al discloses: 7. A computer program that realizes, by being installed on an information

processing system,

       first means for creating a transition engine model based on data obtained by

      driving an actual engine while changing a value of at least one controlled factor in a

      transition state in which an engine rotation speed or torque changes with time **(col. 5,**

      lines 46-59 and col. 6, lines 35-42 and lines 46-59, teaches an autoregressive moving

      average model is utilized for the model of a system which controls the idling speed of

      the engine. The constants for the model are determined experimentally by means of

a step response. It would have been obvious to one of ordinary skill in the art to

drive an engine to gather experimental data for better accuracy.);

second means for emulating actual control means that controls an actual engine,

generating an engine control signal based on a control value set for the controlled factor

(col. 3, lines 66 to col. 4, line 5 and col. 19, lines 30-35, teaches a control means), and

operating the transition engine model as a virtual engine; and

third means for switching to an engine control signal generated in the second step

from a corresponding portion of an engine control signal output from actual control

means, and supplying the switched signal to the actual engine **(col. 3, lines 26-37, col. 21,**

lines 60-63 and col. 23, lines 57-62, teaches a dynamic model to control the idling

speed of an internal combustion engine.).

Kawai et al does not expressly disclose a computer program that realizes, by being installed on

an information processing system and operating the transition engine model as a virtual engine.

Santori et al, however, discloses a computer program that realizes, by being installed on an

information processing system **(see fig. 1, computer system)** and operating the transition engine

model as a virtual engine **(col.4 47-52, 58-63 and fig. 2A, teaches simulation of automobile**

coupled to control unit).

Kawai et al and Santori et al are analogous art because they are from similar problem solving

area of designing control unit. At the time of the invention it would have been obvious to person

of ordinary skill in the art to utilize the principles of testing control unit using hardware-in-the-

loop simulation as discussed by Santori et al to test the unit to control idling speed of an engine

for purpose of testing response of a control unit **(Santori et al: col. 58-64)**.

Santori et al discloses: 8. A storage medium that is readable with an information processing

system on which the computer program according to claim 7 is stored **(see fig. 1, computer)**.

Conclusion

10. All claims are rejected.

11. The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Hung Havan whose telephone number is (571) 270-7864. The

examiner can normally be reached on Monday thru Friday, 9am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be obtained

from either Private PAIR or Public PAIR. Status information for unpublished applications is available

through Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the

Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Kamini S Shah/

Supervisory Patent Examiner, Art Unit 2128

/HUNG HAVAN/

Examiner, Art Unit 2128

12/14/2009